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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte STEVEN B. DAWES,
Daniel W. Hawtof, Michael T. Murtagh, John S. Rosettie,
Andrew P. Schermerhorn, Merrill F. Sproul, John Stone III, and
Pushkar Tandon

Appeal 2010-003658
Application 10/053,365
Technology Center 1700

Before JEFFREY T. SMITH, KAREN M. HASTINGS, and
MARK NAGUMO, *Administrative Patent Judges*.

NAGUMO, *Administrative Patent Judge*.

DECISION ON APPEAL

A. Introduction[1]

Steven B. Dawes, Daniel W. Hawtof, Michael T. Murtagh, John S. Rosettie, Andrew P. Schermerhorn, Merrill F. Sproul, John Stone III, and Pushkar Tandon ("Dawes") timely appeal under 35 U.S.C. § 134(a) from the final rejection[2] of claims 1-3, 7-14, 17-21, 23, 29, 30, 32-41, 44, 45, 51-53, 56, and 132-140, which are all of the pending claims. We have jurisdiction. 35 U.S.C. § 6. We REVERSE.

The subject matter on appeal relates to a method of making preforms for optical fibers in which a soot preform is exposed to a doping atmosphere for a period of time, followed by at least partial evacuation of the doping atmosphere, after which a fresh charge of doping atmosphere is provided. The process may be repeated multiple times. According to Dawes, this so-called "pulsed doping" method requires less doping gas, which reduces processing as well as environmental costs. (Spec. 5, l. 32 to 6, l. 3.)
A critical feature of the appealed process is that the pressure of the doping gas is allowed to decrease during the time it reacts with the soot preform. Doped optical fibers can be pulled from the finished preforms.

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[1] Application 10/053,365, *Methods and Apparatus for Pulsed Doping or Drying a Soot Preform*, filed 26 October 2001. The Specification is referred to as the "365 Specification," and is cited as "Spec." The real party in interest is listed as Corning, Inc. (Appeal Brief, filed 10 August 2009 ("Br."), 1.)

[2] Office action mailed 9 March 2009.

Representative Claim 1 reads:

1. A method of manufacturing an optical waveguide preform, said method comprising the steps of:

providing a first gaseous atmosphere including a first halogen-containing gas to a soot preform contained in a vessel, the first halogen-containing gas being selected from the group consisting of SiF_4, SF_6, CF_4, C_2F_6, COF_2, $C_2F_2Cl_2$, and F_2;

maintaining the first gaseous atmosphere between 1100 and 1300 °C, for a first reacting time sufficient to at least partially dope the soot preform,

wherein the first halogen-containing gas has a partial pressure which decreases during the first reacting time,

wherein no more than 0.5 slpm of the first gaseous atmosphere flows out of the vessel during the first reacting time, and

wherein the first gaseous atmosphere is pressurized to a gage pressure of at least 0.1 atm gage during the first reacting time;

evacuating at least a portion of the first gaseous atmosphere from the vessel;

providing the vessel with a second gaseous atmosphere including a second halogen-containing gas, the second halogen-containing gas being selected from the group consisting of SiF_4, SF_6, CF_4, C_2F_6, COF_2, $C_2F_2Cl_2$, and F_2; and

maintaining the second gaseous atmosphere between 1100 and 1300 °C, for a second reacting time sufficient to further dope the soot preform, wherein the second halogen-containing gas has a partial pressure which decreases during the second reacting time, and wherein the second gaseous atmosphere is pressurized to a gage pressure of at least 0.1 atm gage during the second reacting time;

> wherein the soot preform is retained in the vessel throughout and between: the step of maintaining the first gaseous atmosphere, the step of evacuating at least a portion of the first gaseous atmosphere, the step of providing the second gaseous atmosphere, and the step of maintaining the second gaseous atmosphere.

(Br. , Claims App. 1 [pages unnumbered]; indentation, paragraphing, and emphasis added.)

The Examiner maintains the following ground of rejection:[3]

> Claims 1-3, 7-14, 17-21, 23, 29, 30, 32-41, 44, 45, 51-53, 56, and 132-140 stand rejected under 35 U.S.C. § 103(a) in view of Kyoto[4] alone, or combined with the teachings of Walker,[5] Dobbins,[6] Biswas[7], Simms, [8] and Korenowski.[9] (The Examiner relies on Official Notice in rejecting claims 11, 12 and 29.)

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[3] Examiner's Answer mailed 16 October 2009 ("Ans.").

[4] Michihisa Kyoto et al., *Method for Producing Glass Preform for Optical Fiber*, U.S. Patent 5,158,587 (1992).

[5] Ford T. Walker, *Process for the Simultaneous Production of Wet Process Phosphoric Acid and Sodium Silicofluoride*, U.S. Patent 4,178,347 (1979)

[6] Michael S. Dobbins and Robert E. McLay, *Method of Making Fused Silica by Decomposing Siloxanes*, U.S. Patent 5,043,002 (1991).

[7] Dipak R. Biswas and Satyabrata Raychaudhuri, *Method of Applying Hermetic Coating on Optical Fiber*, U. S. Patent 4,575,463 (1986).

[8] Robert A. Simms, *Method of Making Polarized Ophthalmic Glass*, U.S. Patent 4,339,256 (1982).

[9] Theodore Frank Korenowski and Leslie Emery Lancy, *Regeneration of Plastic Etchants*, U.S. Patent 4,118,295 (1978).

B. Discussion

Findings of fact throughout this Opinion are supported by a preponderance of the evidence of record.

We reverse for the reasons well-stated by Dawes. Kyoto, the principal reference on which the Examiner relies, seeks to provide glass preforms containing fluorine in an increased amount compared to prior art methods, with fewer or no bubbles in the preform. (Kyoto col. 2, ll. 45-48.) In Kyoto's words, "by simply heating the porous preform in a sealed vessel pressurized with the fluorine-containing compound, any glass preform having good quality cannot be produced." (*Id.* at col. 3, ll. 16-19.) Kyoto teaches that such a method can result in the contamination of the preform by materials from the vessel wall, and the reaction efficiency can fall due to thermal decomposition of the doping compound. (*Id.* at ll. 19-22.) According to Kyoto, these problems are avoided by continuously providing fresh SiF_4. (*Id.* at ll. 39-44.)

In Kyoto, Example 1, on which the Examiner relies, in an apparatus illustrated in Figure 4, a vessel 3 containing a soot preform 2 is maintained under pure SiF_4 at a pressure of 4 atm at 1,100 °C for 4 hours. The Examiner argues that reaction of the SiF_4 with the preform must result in a drop in SiF_4 pressure that is not compensated by the provision of additional gas. (Ans. 6. last para.) The Examiner appears to draw this conclusion because Figure 4, unlike Figure 5, does not contain an exhaust port, and therefore, apparently, gas is not added. This conclusion is contrary to the teachings of Kyoto regarding the proper way to make soot preforms. The Examiner has not explained why a person skilled in the art would have been

motivated to modify the process taught by Kyoto in a manner that would lead directly to the problems Kyoto seeks to avoid. The Examiner also appears to have overlooked Example 3, in which the apparatus shown in Figure 4 is used to make a preform under a SiF_4 flowing at 50 ml/min. (Kyoto col. 4, ll. 38-43.)

The Examiner insists that the rejection relies on a non-preferred embodiment. (Ans. 13, 2d full para.) The difficulty is, Kyoto's statement at column 2, line 63 ("[p]referrably, SiF_4 is flowed in the atmosphere") notwithstanding, the Examiner has failed to direct our attention to any credible evidence that a person of ordinary skill in the art would have understood this to indicate a method in which the partial pressure of the SiF_4 doping gas is allowed to drop during the doping period. As Dawes argues, Kyoto effectively teaches against such processes. (Br., para. bridging 11-12.)

It follows that the remaining references, on which the Examiner relies (Ans. 9, ll. 12-14) as evidence that semicontinuous processes are known and that it would have been obvious to modify the process taught by Kyoto in such a manner, are not effective for the purpose the Examiner intends.

C. Order

We REVERSE the Examiner's rejection of the appealed claims.

REVERSED

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